WHAT IS CLAIMED IS:

1.   A color data accuracy calculation method comprising:

5   extracting from a plurality of color signal pairs each including an input color signal in an input color space and a counterpart output color signal in an output color space, a target color signal pair including a target input color signal and a counterpart target output color signal in the output color

10   space, which is to be calculated an accuracy thereof;

extracting from the plurality of color signal pairs, a plurality of output vicinity color signals corresponding to a plurality of input vicinity color signals, which are located in the vicinity of the target input color signal in the input

15   color space; and

calculating a color signal pair accuracy of the target color signal pair on the basis of a relation between the target output color signal and the plurality of output vicinity color signals.

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2.   The method according to claim 1, wherein the calculating is calculating the color signal pair accuracy using a color signal statistical distance, which is a statistical distance between the target output color signal and the plurality

25   of output vicinity color signals.

3.   The method according to claim 2, the calculating

is calculating the color signal pair accuracy using a monotone decreasing and smooth function of the color signal statistical distance.

4.   The method according to claim 2, wherein:

the color signal pair accuracy takes a value indicating abnormal when the color signal statistical distance is larger than a predetermined value; and

the color signal pair accuracy takes another value indicating normal when the color signal statistical distance is not larger than the predetermined value.

5.   The method according to claim 1, wherein:

the calculating includes:

clustering the plurality of output vicinity color signals into at last two clusters; and

calculating the color signal pair accuracy using:

a cluster statistical distance between a gravity point of one of the clusters to which the target output color signal belongs and distribution of the plurality of output vicinity color signals; and

a color statistical distance between the target output color signal and the distribution of the plurality of output vicinity color signals.

6.   The method according to claim 5, wherein:

the calculating is calculating the color signal pair
accuracy using a monotone decreasing and smooth function of
a total distance, which is obtained from the color signal
statistical distance and the cluster statistical distance.

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      7.   The method according to claim 5, wherein:
the color signal pair accuracy takes a value indicating
abnormal when a total distance, which is obtained from the color
signal statistical distance and the cluster statistical distance,

10   is larger than a predetermined value; and
      the color signal pair accuracy takes another value
indicating normal when the total distance is not larger than
the predetermined value.

15   8.   The method according to claim 2, wherein the
statistical distance is a distance with being taken dispersion
of distribution of the output vicinity color signal into
consideration.

20   9.   A color process method comprising:
extracting from a plurality of real data pairs each
including:

            an input color signal in an input color space
            to one of a color image input apparatus and a color

25   image output apparatus; and
            a counterpart output color signal in an output
            color space,

a target color signal pair including a target input color signal and a counterpart target output color signal in the output color space, which is to be calculated an accuracy thereof;

extracting from the plurality of real data pairs, a
5   plurality of output vicinity color signals corresponding to a plurality of input vicinity color signals, which are located in the vicinity of the target input color signal in the input color space;

calculating a color signal pair accuracy of the target
10   color signal pair on the basis of a relation between the target output color signal and the plurality of output vicinity color signals;

repeating the extracting the target color signal pair, the extracting the output vicinity color signals, and the
15   calculating the color signal pair accuracy while changing the target color signal pair to calculate accuracies of the real data pairs; and

calculating a prediction output color signal corresponding to a desired input color signal based on the real
20   data pairs and the accuracies of the real data pairs.

10.   The method according to claim 9, further comprising:

when it is judged that at least one of the real data pairs is abnormal in the accuracy thereof, outputting at least one
25   of the accuracy of the at least one of the real data pairs and information concerning the at least one of the real data pairs.

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11. A color data accuracy calculation apparatus comprising:

a target color signal pair extraction section for extracting from a plurality of color signal pairs each including an input color signal in an input color space and a counterpart output color signal in an output color space, a target color signal pair including a target input color signal and a counterpart target output color signal in the output color space, which is to be calculated an accuracy thereof;

an output vicinity color signal extraction section for extracting from the plurality of color signal pairs, a plurality of output vicinity color signals corresponding to a plurality of input vicinity color signals, which are located in the vicinity of the target input color signal in the input color space; and

a color signal pair accuracy calculation section for calculating a color signal pair accuracy of the target color signal pair on the basis of a relation between the target output color signal and the plurality of output vicinity color signals.

12. The apparatus according to claim 11, wherein the color signal pair accuracy calculation section calculates the color signal pair accuracy using a color signal statistical distance, which is a statistical distance between the target output color signal and the plurality of output vicinity color signals.

13. The apparatus according to claim 12, the color

signal pair accuracy calculation section calculates the color signal pair accuracy using a monotone decreasing and smooth function of the color signal statistical distance.

5   14.   The apparatus according to claim 12, wherein:
the color signal pair accuracy calculation section calculates the color signal pair accuracy so that:
the color signal pair accuracy takes a value indicating abnormal when the color signal statistical
10   distance is larger than a predetermined value; and
the color signal pair accuracy takes another value indicating normal when the color signal statistical distance is not larger than the predetermined value.

15   15.   The apparatus according to claim 11, wherein:
the color signal pair accuracy calculation section clusters the plurality of output vicinity color signals into at last two clusters; and
the color signal pair accuracy calculation section
20   calculates a cluster statistical distance between a gravity point of one of the clusters to which the target output color signal belongs and distribution of the plurality of output vicinity color signals;
the color signal pair accuracy calculation section
25   calculates a color statistical distance between the target output color signal and the distribution of the plurality of output vicinity color signals; and

the color signal pair accuracy calculation section calculates the color signal pair accuracy using the cluster statistical distance and the color signal statistical distance.

16. The apparatus according to claim 15, wherein:
the color signal pair accuracy calculation section calculates the color signal pair accuracy using a monotone decreasing and smooth function of a total distance, which is obtained from the color signal statistical distance and the cluster statistical distance.

17. The method according to claim 15, wherein:
the color signal pair accuracy calculation section calculates the color signal pair accuracy so that:
    the color signal pair accuracy takes a value indicating abnormal when a total distance, which is obtained from the color signal statistical distance and the cluster statistical distance, is larger than a predetermined value; and
    the color signal pair accuracy takes another value indicating normal when the total distance is not larger than the predetermined value.

18. The method according to claim 12, wherein the statistical distance is a distance with being taken dispersion of distribution of the output vicinity color signal into consideration.

19.   A color process apparatus comprising:

a color signal pair accuracy calculation section includes:

a target color signal pair extraction section for extracting from a plurality of real data pairs each including:

an input color signal in an input color space to one of a color image input apparatus and a color image output apparatus; and

a counterpart output color signal in an output color space,

a target color signal pair including a target input color signal and a counterpart target output color signal in the output color space, which is to be calculated an accuracy thereof;

an output vicinity color signal extraction section for extracting from the plurality of real data pairs, a plurality of output vicinity color signals corresponding to a plurality of input vicinity color signals, which are located in the vicinity of the target input color signal in the input color space;

a calculation section for calculating a color signal pair accuracy of the target color signal pair on the basis of a relation between the target output color signal and the plurality of output vicinity color signals, wherein the color signal pair accuracy calculation section calculates accuracies of the real data pairs; and

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a prediction output color signal calculation section for calculating a prediction output color signal corresponding to a desired input color signal based on the real data pairs and the accuracies of the real data pairs.

20. The apparatus according to claim 19, further comprising:

an output section, wherein:

when it is judged that at least one of the real data pairs is abnormal in the accuracy thereof, the output section outputs at least one of the accuracy of the at least one of the real data pairs and information concerning the at least one of the real data pairs.

21. A color data accuracy calculation program causing a computer to execute a process comprising:

extracting from a plurality of color signal pairs each including an input color signal in an input color space and a counterpart output color signal in an output color space, a target color signal pair including a target input color signal and a counterpart target output color signal in the output color space, which is to be calculated an accuracy thereof;

extracting from the plurality of color signal pairs, a plurality of output vicinity color signals corresponding to a plurality of input vicinity color signals, which are located in the vicinity of the target input color signal in the input color space; and

calculating a color signal pair accuracy of the target color signal pair on the basis of a relation between the target output color signal and the plurality of output vicinity color signals.

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22.   A color process program causing a computer to execute a process comprising:

extracting from a plurality of real data pairs each including:

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an input color signal in an input color space to one of a color image input apparatus and a color image output apparatus; and

a counterpart output color signal in an output color space,

15   a target color signal pair including a target input color signal and a counterpart target output color signal in the output color space, which is to be calculated an accuracy thereof;

extracting from the plurality of real data pairs, a plurality of output vicinity color signals corresponding to

20   a plurality of input vicinity color signals, which are located in the vicinity of the target input color signal in the input color space;

calculating a color signal pair accuracy of the target color signal pair on the basis of a relation between the target

25   output color signal and the plurality of output vicinity color signals;

repeating the extracting the target color signal pair,

the extracting the output vicinity color signals, and the calculating the color signal pair accuracy while changing the target color signal pair to calculate accuracies of the real data pairs; and

5   calculating a prediction output color signal corresponding to a desired input color signal based on the real data pairs and the accuracies of the real data pairs.

23.   A computer readable recoding medium storing a color
10   data accuracy calculation program causing a computer to execute a process comprising:

extracting from a plurality of color signal pairs each including an input color signal in an input color space and a counterpart output color signal in an output color space,
15   a target color signal pair including a target input color signal and a counterpart target output color signal in the output color space, which is to be calculated an accuracy thereof;

extracting from the plurality of color signal pairs, a plurality of output vicinity color signals corresponding to
20   a plurality of input vicinity color signals, which are located in the vicinity of the target input color signal in the input color space; and

calculating a color signal pair accuracy of the target color signal pair on the basis of a relation between the target
25   output color signal and the plurality of output vicinity color signals.

24. A computer readable recording medium storing a color process program causing a computer to execute a process comprising:

extracting from a plurality of real data pairs each including:

an input color signal in an input color space to one of a color image input apparatus and a color image output apparatus; and

a counterpart output color signal in an output color space,

a target color signal pair including a target input color signal and a counterpart target output color signal in the output color space, which is to be calculated an accuracy thereof;

extracting from the plurality of real data pairs, a plurality of output vicinity color signals corresponding to a plurality of input vicinity color signals, which are located in the vicinity of the target input color signal in the input color space;

calculating a color signal pair accuracy of the target color signal pair on the basis of a relation between the target output color signal and the plurality of output vicinity color signals;

repeating the extracting the target color signal pair, the extracting the output vicinity color signals, and the calculating the color signal pair accuracy while changing the target color signal pair to calculate accuracies of the real data pairs; and

calculating a prediction output color signal corresponding to a desired input color signal based on the real data pairs and the accuracies of the real data pairs.

5   25.   A color processing method comprising:

calculating color signal pair accuracies of target color signal pairs, wherein each of target color signal pairs includes a target input color signal and a target output color signal;

obtaining a color prediction model F expressed by formal

10   (1),

F (an input color signal) = an output color signal

(1)

using the calculated color signal pair accuracies and the target color signal pairs; and

15   obtaining an inverse model of the color prediction model F.

26.   The color processing method according to claim 25, further comprising:

20   predicting at least a part of an input color signal from a counterpart output color signal and the rest part of the input color signal using the obtained inverse model.

27.   The color processing apparatus comprising:

25   a color signal accuracy calculating section for calculating color signal pair accuracies of target color signal pairs, wherein each of target color signal pairs includes a

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target input color signal and a target output color signal; and

a color prediction section for:

obtaining a color prediction model F expressed by formal (1),

F (an input color signal) = an output color signal

(1)

using the calculated color signal pair accuracies and the target color signal pairs; and

obtaining an inverse model of the color prediction model F.

28. The color processing apparatus according to claim 27, wherein the color prediction section predicts at least a part of an input color signal from a counterpart output color signal and the rest part of the input color signal using the obtained inverse model.